

# LISTing Newsletter

Newsletter of the Long Island Sinclair/Timex Users Group  
(Incorporating N.Y.T.S.E.)

November 1992  
Issue



Next Meeting  
Nov 8, 1992

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### *LISTing Policy*

*Annual Dues...\$16.00*

*One "sample" copy sent upon receipt of a large SASE.*

*Copies provided on EXCHANGE BASIS with other bona fide user groups. LISTing is published monthly except July and August by LIST (Long Island Sinclair Timex) Group, a non profit user group.*

*We are always looking for articles, programs, reviews, etc. to keep our members informed and entertained. You maintain full copyright.*

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# LIST OFFICERS

\*\*\*\*\*  
 PRES. HARVEY RAIT  
 TRES. ROBERT MALLOY  
 COR. SEC. JOHN PZMIND  
 EDITOR. FRED STERN  
 LIBR. TOM SKAPINSKI  
 \*\*\*\*\*

PLEASE SEND INQUIRIES TO:  
 LIST  
 MR. HARVEY RAIT  
 5 PERI LANE  
 VALLEY STREAM, N.Y. 11581

PLEASE SEND SUBMISSIONS TO:  
 LISTING  
 MR. FREDERIC STERN  
 214 ROBERTS ST.  
 HOLBROOK, N.Y. 11741  
 \*\*\*\*\*

## NYTSE

\*\*\*\*\*  
 NYTSE MEETS ON MONDAY THE WEEK  
 AFTER THE LIST MEETING AT:  
 MISS KIMS RESTAURANT  
 PARK AVENUE SOUTH  
 BETWEEN 21 ST. AND 22 ST.  
 MEETINGS START 7:30 PM.

## COMING EVENTS:

\*\*\*\*\*  
 NOV. 8, 1992 LIST MEETING.  
 NOV. 16, 1992 NYTSE MEETING

MEETING MINUTES  
 REPORTED BY:  
 HARVEY RAIT

OCT. 10, 1992

\*\*\*\*\*  
 HARVEY CALLED THE MEETING TO  
 ORDER AT 2:15PM.

TODAYS MEETING WAS ATTENDED BY  
 9 MEMBERS.

THE NEWSLETTER EXCHANGE WAS  
 DISCUSSED. WE ARE NOT RECEIVING  
 NEWSLETTERS FROM OTHER USER  
 GROUPS IN EXCHANGE FOR LISTING.  
 A NOTE WILL BE PLACED IN LIST-  
 INGS SENT TO OTHER USER GROUPS  
 ADVISING THAT IF WE DO NOT HEAR  
 FROM THEM BY FEB. 1993, WE WILL  
 DROP THEM FROM OUR EXCHANGE  
 PROGRAM. IF THEY ARE NOT  
 PUBLISHING ON A REGULAR MONTHLY  
 BASIS, SEND US A LETTER SAYING  
 SO AND WE WILL CONTINUE TO SEND  
 AN EXCHANGE COPY MONTHLY.  
 A DISCUSSION WAS HELD REGARDING  
 THE POSSIBILITY OF EXCHANGING  
 NEWSLETTERS WITH FOREIGN T/S  
 USER GROUPS

\*\*\*\*\*  
 LONG ISLAND SINCLAIR TIMEX

USERS GROUP PRESENTS

ZX-81 AND TS1000

TECHNICAL TIDBITS

PART II

LIMARC HAMFEST AND FLEAMARKET  
 \*\*\*\*\*

ON SEPT. 20, TOM, KEITH AND MARK  
 SKAPINSKI WITH MIKE AND FRED  
 STERN WENT TO THE LIMARC HAMFEST  
 AND FLEAMARKET ON THE GROUNDS OF  
 N.Y.I.T. IN GREENVALE.  
 THE FLEAMARKET HAD SOME GREAT  
 BUYS ON SURPLUS AND USED COMPUT-  
 ER EQUIPMENT AND PERIPHERALS.  
 EVEN A ZX-81 WITH 16K RAM PACK  
 COULD BE FOUND AND BOUGHT FOR  
 \$20.00.  
 OTHER HARDWARE OF INTEREST;  
 KEYBOARDS OF VARIOUS TYPES AND  
 STYLES, CABLES TO CONNECT YOUR  
 COMPUTER TO A T.V. OR MONITOR,  
 SURPLUS I.C., VARIOUS TYPES OF  
 DISK DRIVES AND POWER SUPPLIES.  
 THE DAY WAS BEAUTIFUL AND THE  
 BARGAINS WERE PLENTIFUL. I  
 STRONGLY RECOMMEND THAT IF YOU  
 CAN, GO TO THE NEXT ONE.

## DEMONSTRATION

\*\*\*\*\*  
 BOB GILDER DEMONSTRATED A  
 PROGRAM IN WHICH 8 WINDOWS AT  
 ONE TIME CAN BE OPERATED ON A  
 QL. AN ARTICLE ABOUT THIS  
 PROGRAM WILL APPEAR IN A FUTURE  
 ISSUE OF LISTING.

NEXT MEETING FRED AND MIKE WILL  
 HAVE A TS1000 DEMONSTRATION.

## CLASSIFIEDS

\*\*\*\*\*  
 THIS CLASSIFIED SECTION IS  
 AVAILABLE TO ALL LIST MEMBERS  
 FREE OF CHARGE.  
 THE ONLY RESTRICTION IS THAT  
 IT IS TO BE USED ONLY FOR THE  
 SEEKING, SELLING OR SWAPPING  
 OF SINCLAIR, TIMEX OR MICROACE  
 COMPUTER EQUIPMENT, PERIPHERALS  
 AND SOFTWARE.  
 LISTING, LIST, AND ITS OFFICERS  
 DO NOT ENDORSE, WARRANTY, OR  
 GUARANTEE ANY OF THE ITEMS  
 LISTED IN THIS CLASSIFIED  
 SECTION

\*\*\*\*\*  
 THE FOLLOWING PUBLICATIONS ARE  
 AVAILABLE ONLY THROUGH LIST:

ZX-81/TS1000 TECHNICAL TIDBITS  
 TECHNICAL TIDBITS PART II  
 SAVINGS AND LOAD OF THE TIMEX  
 COMPUTER  
 \$4.00 EACH.

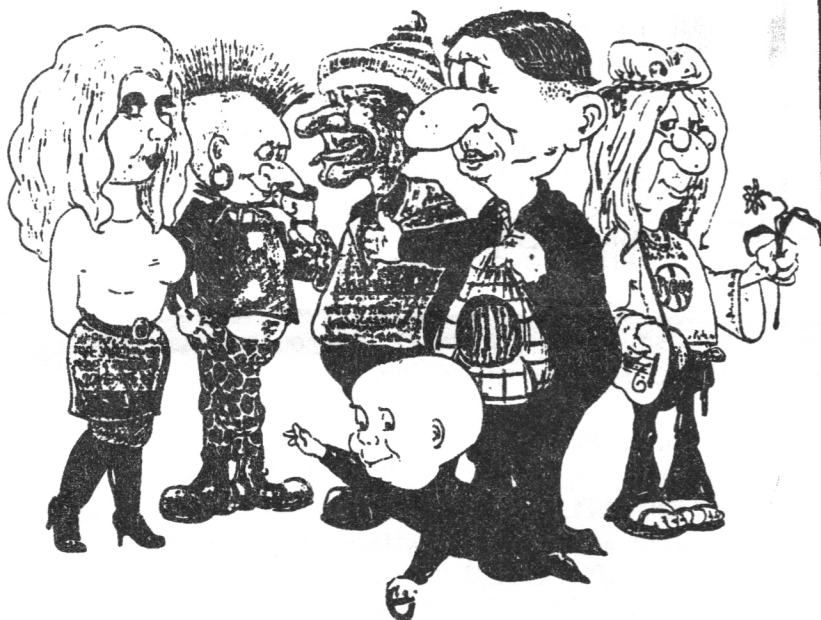
I AM INTERESTED IN AN AERCO DISK  
 SYSTEM FOR THE TS1000 OR TS2068.  
 FRED STERN; 516-737-963 OR  
 WRITE ME AT THE ADDRESS ABOVE.

CONTINUE ON PAGE 3



**SINCLAIR EVERYWHERE**

# Meet the Gang!



## L.I.S.T.

FROM PAGE 2

A FINAL WORD

\*\*\*\*\*  
MY NAME IS FRED STERN AND I AM  
THE EDITOR OF THIS EDITION OF  
LISTING.

I WOULD LIKE TO EXTEND SPECIAL  
THANKS TO HARVEY RAIT FOR  
ACTING AS THE MEETING REPORTER  
IN MIKES AND MY ABSENTS.

THIS ISSUE REPRINTS SOME GREAT  
ARTICLES FROM THE FOLLOWING  
NEWSLETTERS:

C.A.T.S.  
QL BULLETIN  
S.W.Y.M.

THIS INFORMATION IS REPRINTED  
FOR THE BENEFIT OF US ALL. SO  
THAT NEW USERS CAN LEARN AND OLD  
USERS REFRESH THEIR RAMPACKS.

SPECIAL THANKS TO:  
TOM SKAPINSKI  
BOB GILDER  
AND AGAIN TO HARVEY.

SEE YOU ALL AT THE NEXT MEETING.

Here's a gift from G. Russell  
Electronics to TS2068 owners.  
Have a nice day.

```

10>BORDER RND*7
20 LET X=RND*255: LET Y=RND*17
6
30 LET Z=10+RND*35
40 BEEP RND*.7,Z-45
50 IF Z>=X OR Z>=Y OR Z+X>=255
OR Z+Y>=175 THEN GO TO 10
60 CIRCLE X,Y,Z
62 LET Q=.7*Z
64 LET E=RND*Q: LET X1=X-E
65 LET D=30R (Q+2-E+2): LET Y1
=Y-D
67 PLOT X1,Y1
70 LET X2=E+D: LET Y2=D-E
73 DRAW X2,Y2,.5*PI: LET E=.5*
E: LET D=.5*D
74 CIRCLE X+E,Y+D,.07*Z: CIRCLE
E X-D,Y+E,.07*Z
75 IF Z>35 THEN CLS
80 GO TO 10
    
```

HERES "DRIBBLER", A GAME FOR THE  
TS1000. YOU CAN SHOOT ONLY  
WHILE IN MOTION - HIT THE "1"  
KEY TO SHOOT.

```

3>STOP
6 LET H=0
8 LET S=0
10 PRINT AT 21,0;"SHOTS: ";S
15 PRINT AT 21,10;"BASKETS: ";
H
16 LET B=INT (RND*31)
17 PRINT AT 0,B;" "
18 LET G=0
20 LET Y=RND*32
25 IF G>Y THEN GOTO 20
30 FOR X=G TO Y
35 LET X=INT X
40 PRINT AT 20,X;"0"
50 PRINT AT 20,X-1;" "
55 IF INKEY$="1" THEN GOTO 130
60 NEXT X
70 LET L=RND*32
75 IF L>Y THEN GOTO 70
80 FOR N=0 TO L
90 PRINT AT 20,Y-N-1;"0"
95 PRINT AT 20,Y-N;" "
100 IF INKEY$="1" THEN GOTO 120
110 NEXT N
115 LET G=Y-L
120 GOTO 20
125 LET X=Y-N-1
135 FOR F=0 TO 20
140 PRINT AT 19-F,X;"0";AT 19-
+1,X;" "
150 NEXT F
153 LET S=S+1
155 IF B=X THEN LET H=H+1
160 CLS
170 GOTO 10
206 LET H=0
    
```

It is always possible to copy any program by using a dual cassette deck. So, the first step in program security is to make it impossible to access or tamper with your programs. The following program is the closest I have reached to a perfectly safe program.

An Access Code is asked for. If the entered code is incorrect then the program will NEW itself. If the BREAK key (or STOP key during the INPUT prompt) is pressed then the program will stop but it will be impossible for the tamperer to LIST, EDIT, or RUN the program. The computer appears to contain no program in its memory.

Of course, if the hacker knows to reset the address 16509 to 0 then the program will run without any problems, but I am sure that this simple program could be extended to include many other faulty address values and at least make the program very troublesome to break into.

-David Kulp

```

10 REM THIS IS OUR PROGRAM
20 PRINT "HELLO--GOODBYE"
30 STOP
9900 SAVE "SECURITY"
9910 POKE 16509,73
9920 PRINT "ENTER THE ACCESS CODE"
9930 INPUT CODE
9940 IF CODE PEEK 16509 THEN NEW
9950 PRINT "ACCESS CODE ACCEPTED"
9960 PAUSE 60
9970 POKE 16509,0
9980 RUN

```

\*\*ENTER YOUR SPECIAL ACCESS  
CODE IN LINE 9910\*\*



## Looping the 2068

by Murray and Caroline Barasch

Here's our program to draw (on the 2068) an ellipse with center at X,Y; semi-major axis (half width) A; semi-minor axis (half height) B; rotated from the horizontal by angle R (radians, not degrees).

```

10 INPUT "INPUT X,Y,A,B,R" X,Y,A,B,R
20 FOR T=0 TO 2*PI STEP .05
30 PLOT X+A*COS T*COS R-B*SIN T*
  SIN R,Y+A*COS T*SIN R+B*SIN T*CO
  S R
40 NEXT T

```

This was based on parametric equations for the ellipse, modified by rotation through angle R and translated to a new center.

### Editor's Note

The INPUT statement on the 2068 is almost as flexible as the PRINT. With multiple entries in a single INPUT, you'll have to press ENTER after each variable. To convert to the 1000, just put in separate INPUT statements, and remember to keep the numbers smaller.

TS2068

```

1 REM ART by David Kulp
2 PAPER 0: INK 7: BORDER 0: C
  LS
5 PRINT #1;"PRESS SPACE BAR T
  O CLS."
10 LET a= INT(RND*255): LET b=
  INT(RND*175)
20 LET x= INT(RND*255): LET y=
  INT(RND*175)
30 LET a1=2: LET b1=2: LET x1=
  4: LET y1=4
40 PLOT a,b: DRAW x-a,y-b
50 LET a=a+a1: LET b=b+b1
60 LET x=x+x1: LET y=y+y1
70 IF INKEY$=" " THEN CLS: PR
  INT #1;"PRESS SPACE BAR TO CLS."
100 IF a>255 OR a<0 THEN LET
  a1=-a1: LET a=a+a1
110 IF x>=255 OR x<=0 THEN LET
  x1=-x1: LET x=x+x1
120 IF b>=175 OR b<=0 THEN LET
  b1=-b1: LET b=b+b1
130 IF y>=175 OR y<=0 THEN LET
  y1=-y1: LET y=y+y1
140 GOTO 40

```



## QL CORNER

Last month I failed to mention two additional publications providing sources for software and hardware for the QL - they are as follows:

UPDATE Magazine published by Frank and Carol Davis, P. O. Box 1095, Peru, IN 46970 - \$18.00 per year - 4 issues.

QUANTA, The Independent QL User Group, Membership Secretary, Bill Newell, 213 Manor Road, Benfleet, Essex SS7 4JD, UK - £17.00, USA.

Quanta is now in their 9th year as an international QL User Group. Membership is large, encompassing the world and their membership is made up from every country in Europe, some from Asia, New Zealand, Australia, South America, Africa and of course, the US. They have a software library containing at least 50, 720K disks, free to members.

I truly believe that without QUANTA in the QL picture, the QL would not have the hardware and Software support as it does today, as many suppliers for the QL are QUANTA members.

Mentioned in last months QL Corner, I am listing some of the QL software and hardware suppliers throughout the QL World.

From Germany - two prolific software/hardware developers and distributors:

- Jochen Merz Software, Im stillen Winkel 12-W-4100 Duisburg 11 Germany. Software types range from games, utilities, programming and applications. Hardware includes a PC keyboard interface, FLP/Level 2 replacement ROM for the Trump Card interface, Atari QL-Emulators cables and adapters. Credit Cards accepted.

- Jurgen Falkenberg, Thanweg 36, D-7539 Ersingen Germany. Software - utilities, astronomy and storage oscilloscope. Hardware includes an Eprom programmer, QL Scanner, Digitizing measuerment and control interfaces, QL Mouse and much more. Payment in Stearling or DM.

Both suppliers have catalogs - send at least two International Reply Cupons (available from Post Office) to the addresses above to obtain their listings.

- W. N. Richardson & Co. (formally ECC), 18-21 Misbourne House, Chiltern Hill, Chalfont T. Peter, Bucks SL9 9UE, UK - QL computers, PC keyboard interface (will operate with any PC keyboard), QL Mouse, Disk Drives, Monitors and printers - also microdrive cartridges, Psion Software, power supply, and the main IC's used within the QL. Credit card accepted.

- TF Services, 12 Bouverie Place, London W2 1RB, UK, Minerva ROM which replaces the JSU ROM in the QL. (Minerva features a fast RAM test on start up, dual screen and cleaned up many of the known ROM bugs within latest Sinclair ROMs, JM & JSU), Hermes - a replacement IC for the 8049 IPC which clears up keyboard bounce and fast Serial input & output, QL spare parts and QL repairs. Credit Card accepted.

I have purchased items from each of the above suppliers and found them to be equally reliable and honest.

More next month....

Bob Gilder

QL News And Notes - June, 1992 - QL Bulletin

The writer has exchanged letters with the German QL User Group\* and seen one copy of one of their newsletters, which is really a magazine, with a large circulation and nice typesetting. Also, as commented in a letter of the writer's published in Toronto's Sinc-Link N/L, SLIX of California has been able to contact the German group via electronic mail, taking about one week in transit. German ads in the magazine have featured products like hard disks, a QL emulator for the Atari ST (hardware), an interface for an IBM PC keyboard, and other interesting goodies sold by mailorder firms in Germany for the QL user. Quanta has further information on foreign contacts it is understood....A short list of some of the products from Germany and England was published in our QL Technical newsletter (last issue). Replacement membrane keyboard units for the QL are still available it was mentioned. ....This newsletter, the QL Bulletin, may be the first and last issue! A second issue may or may not come through. But let's enjoy it while it is here....The Toronto TS User Club continues to publish articles on all three TS computers, the ZX-81, the TS2068 and the QL. Info on the Z-88 is so sparse that even my attempt to publish a newsletter lasted only one issue, so the Z-88 Brief-Case, as it was called was one of many experiments in launching newsletters looking for a survivor. As mentioned in the first page of this newsletter other attempts at making new newsletters are being contemplated, but in the mean time (and it is a mean time economically here), if the TS newsletters fold, the publication of the Avocational Computerists' Newsletter will continue indefinitely, with similar if not TS specific slant to the coverage....Only a few copies of the newsletters are being sent out, so it is up to the user groups to pick them up and send out photocopies to their mailing list if they want it to get around....As for me, I have a new hobby, history, and the computer is sinking into the background here....A computer hobby interest of the writer's has been data compression programs, and in Germany, some of the latest programs have been adapted to the QL, making for very dramatic performance. A competition sponsored by a UNIX magazine brought forth several interesting programs of compression from the general readership, so even the writing of data compression programs from scratch is not a lost art. This writer has focussed on the diatomic pack in the past, as being more suitable for 8-bit computers with their slower processing speeds and need for a compression or uncompression program which is very small and can be put inside the program, database or whatever, to use the compressed data, without making the overhead of program size kill any saving in compressing the data compared to running it straight. So the focus has been on quick and dirty methods, as compared to the fancy ones used for IBM PC/68000 computers which are much bigger and in another class of requirement for data compression. For more on the diatomic pack see Held, on "Data Compression", J.Wiley Pub. ....Since each copy of the newsletter costs more than \$4 to mail, it would be a courtesy if asking for a copy to send some money....Copies of back-issues are no longer stocked here. Some originals for our newsletters remain to make photocopies from, but we have switched to a just-in-time or just-enough system, copies of each newsletter exhausted at time of issue, and most of the back issues (TS, etc.) gone, used to stuff in with replies to correspondence, it was noted today on looking for some. So the back-issues for \$8, 2 minimum offer has been rescinded for that reason. Luckily back issues are available at some user groups, for those who wish to borrow them and make their own copies. As part of the housekeeping here, something had to go and it was newsletter space....QL books, magazines and software are still advertised by EMSOFT, P.O.B. 8763, Boston, MA, USA 02114-tel (617) 889-0830.... Mechanical Affinity, 5231 Wilton Wood Ct., Indianapolis, IN, USA 46254 (p. Holmgren), also has QL parts and hardware for sale....An article on Success, the CP/M software emulator for the QL, available once for about \$60, is included in the Toronto TS User Club's newsletter, May-June 1992 issue, c/o Out-of-Town Secy. Geo. Chambers, 14 Richome Ct., Scarborough, Ont., Canada M1K 2Y1, who is the person to contact to comment or join the group to get the newsletter on a regular basis. Of course you will find another article on CP/M via emulators on page 4 of this newsletter.... The Vancouver Sinclair User Gp., is still going: contact Rod Humphreys, 10984 Collings Place, Delta, BC, Canada to join....SLIX, is active in QL support, contact Mr. W. Miller, 6675 Clifford Dr., Cupertino, Calif., USA 95014-4530 or exchange a disk of info...CATUG also offers some info on products for the QL, c/o Mr. Bob Swoger, 613 Parkside Circle, Streamwood, IL, USA 60107, (Chicago Area Timex User Gp.).... \*German QL User Gp., c/o Mr. F. Herrmann, Talstrasse 21, W-5460, Ockenfels, Germany.....

# Project Suggestions

For  
T/S 1000

From SWYM  
May/June 1992

## 1. Memory

- a. Battery-backed CMOS in 8K to 40K region.
- b. Battery-backed CMOS in 16K to 48k region
- c. Battery-backed CMOS in 8K to 64K region.
- d. Battery-backed CMOS in 8K to 40K region with 8K bank-switching in 40K to 48K region.
- e. Plug-in memory cards in 16K to 32K region. (CMOS or ROM).
- f. Bank-switched CMOS in 8K to 16 K region.
- g. Revised ROM.
- h. Complete bank-switching in 8K blocks.

## 2. Tape Port

- a. Filter similar to Qsave or Tape Dubber.
- b. RS-232 port (Hardware & software).
- c. Optical computer interface.
- d. Teletype 20 ma. interface.
- e. Video monitor port.
- f. Connect standard serial printer (requires driver program and translation).

## 3. Speaker output.

## 4. Power Supply

- a. Regulated 6 volt input in place of 9 volt.
- b. Completely external 9 volt and 5 volt sources input at rear connector.
- c. Larger heat-sink on internal regulator.
- d. External 9 volt (or 6 volt) battery source with re-charger.
- e. LED indicator on power supply input.

## 5. Keyboard

- a. External standard size keyboard.
- b. Add repeat function to keyboard.
- c. Add more functions to keyboard.
- d. New keyboard with its own processor which interrupts CPU.

## 6. Disk Drive

- a. Adapt IBM type controller and disk drives.
- b. Write software drivers for IBM disk system.
- c. Modify operating system to accept disk commands.

## 7. Input/ Output Ports

- a. Expand I/O port decoding.
- b. Attach parallel port using 8255-5 processor.

7. I/O Ports (continued)
    - c. Attach parallel port using Zilog PIO processor.
    - d. Attach serial port using Zilog SIO processor.
    - e. Attach Digital to Analog (D/A) and A/D converters and write software.
  8. Video Display
    - a. Provide for Inverse video (hardware and/or software).
    - b. Additional font styles
    - c. High resolution graphics (192 x 256 pixels).
    - d. Scaleable fonts (graphics plus software).
    - e. Move program Display Area to fixed location.
    - f. Provide separate processor for display. (Requires modification of operating system software.)
    - g. Provide for 80 column display. (Would require monitor and faster hardware driver and modified software.)
  9. Central Processing Unit
    - a. Faster CPU (ie. Z80-B )
    - b. New computer that runs faster and will emulate ZX81 so that programs are compatible but also has more capability.
  10. Clock
    - a. Time of day and date .
    - b. Count down timer in software.
    - c. Install Zilog CTC.
  11. Operating System Enhancements
    - a. Combine speed of Q-Save with versatility of XLR8 options
    - b. Add functions to BASIC
    - c. Machine code utility programs
  12. Application Software
    - a. Stock Analysis
    - b. Graphical Plotting Program
    - c. Home security system
- 



WHAT...YOU HAVE NOT JOINED L.I.S.T. ??  
WHY ?  
WHAT IS YOUR EXCUSE ?  
MY NAME IS BOB MALLOY.  
ANY QUESTIONS ???





### TS 1000 Notes

1. To initialize without pulling the plug, enter  
RAND USR 0.
2. Program size  $\text{PEEK } 16396 + 256 * \text{PEEK } 16397 - 16509$
3. Variables size  $\text{PEEK } 16404 + 256 * \text{PEEK } 16405 - \text{PEEK } 16400 - 256 * \text{PEEK } 16401$
4. Display size  $\text{PEEK } 16400 + 256 * \text{PEEK } 16401 - \text{PEEK } 16396 - 256 * \text{PEEK } 16397$
5. VAL "4E4" uses 8 bytes, 4E4 uses 9 bytes;  
VAL "40000" uses 10 bytes, 40000 uses 11 bytes.
6. BOTH PRINT and LPRINT delete the leading space of a token when used at the beginning of a PRINT, AT, or TAB statement as well as when followed by another token.
7. To display the bottom two lines use within a program: (line number) POKE 16418,0. Before using SCROLL or INPUT switch off with: (line number) POKE 16418, 2.
8. To print the bottom two lines enter line 1 REM shift J, shift V, function LN, shift C, graphic shift A, function TAN, then POKE 16517,107. Within the program use (line num) RAND USR 16514, then (line num) COPY.
9. With MC programs stored in 1 REM, POKE 16510,0 to change the REM number to 0, and protect it from accidental deletion.
10. To make a line of MC invisible (certain codes will self-destruct when displayed) POKE 16514, 118. Remember the MC now begins at 16516.
11. To make a program run automatically when loaded, SAVE the program with a line statement (usually at the beginning or end of a program). Example: 9010 SAVE "MET" ; 9020 RUN. Now start the tape recorder and enter GOTO 9010. It will run automatically the next time it's loaded.
12. To stop a program from automatically running after loading, go to FAST mode then enter PRINT USR 836. The machine will go into a loading state. Start the tape recorder. When the program has completed loading an error code will appear. Hit enter and the program will LIST.
13. To adjust a tape recorder's volume and/or verify if a program is loading properly, simply stop the tape recorder a few seconds after you have begun to load a tape. The computer will either crash, which means the program was loading correctly, or will continue in a search pattern which means there was a problem with either the title or low volume.

#####



11

"That's right, Murray. The wife and kids are away, and I finally have the computer all to myself."





## Fixing 2050 Modem Boards

### HELP ON REPAIRING 2050 MODEM BOARDS

These board are currently available for pennies on the dollar from several T/S retailers. Early reports of failure to get them working have been replaced by many recent reports of success. Here are some tips from those who won:

"The important thing to remember is that these are NOT units which once worked and have developed a fault. Almost anything can be wrong AND several unrelated faults may be present. A weak point is the ribbon cable..." On the small PC Board which connects to the computer, the cable is VERY insecure. This is due to the lack of a case on that end. One can solve this problem several ways. The easiest is to wrap an insulated wire catty corner through the existing holes in the PC Board and tying it securely so the cable can't move. It's also very easy to make a small "Case" out of wood or plastic. The main point is to prevent the cable from ANY motion relative to the Board. All the wires on the cable should be attached IN ORDER. Examine these to be sure they're all connected. These have even broken during shipping.

**IMPORTANT NOTE!!!** Don't just take the modem out of the box, hook it up to your 206S and try it! Many of these boards have never been powered up and you may very easily damage your computer! With the price of 2068's in the \$140 range, why not test the modem on a T/S 1000? (Dave Schoenwetter's idea). Then you are not taking such a risk.

But even before testing on a 1000, do a THOROUGH and COMPLETE examination of board. First, look for the obvious, missing parts, snapped leads, solder bridges, broken traces and "cold" solder joints. Be patient, look closely, perhaps with a magnifying glass. There SHOULD BE some jumper wires on the non-component side, six to be exact. There should be 5 places where the traces on the PC Board have been intentionally "broken". If you buy the boards from Grey & Clifford, they provide full documentation on this. Before testing you may want to check the ribbon cable at the modem end. It is possible this "press-on" process didn't quite work out, and the ribbon is out-of-line with the pins on the modem board. You won't be able to tell for sure without removing the top piece on the connector.

There have been cases where a computer was damaged due to such mis-aligned leads and/or a small piece of foil inside this connector, shorting out two leads. Judge the risk for yourself, but don't say you weren't warned!

If you have gone ahead and tested it, with no results, you will really need a schematic. This schematic has been found in a number of User Group newsletters. In it's small form, is also provided free with the purchase of cards from G & C Comp. But if you have trouble reading those, G & C sell "Full size" 17 X 22 set of 2 prints which are Very clear for \$5. Once you have the schematic, go through all the components to make sure they are the right value and polarity. On a NUMBER of boards. R-28 and C-22 were snapped and pulled up, but you should have seen that in your first inspection. Also R-13 and R-23 are the wrong values on some boards they should be 2.4 Ohms and 4.7K Ohms respectively. Other components which are frequently bad are the relays and the transformer. If you've gone through all these steps and still no luck, then you will need the help of someone with the proper test equipment and experience. Kurt Casby also wrote an excellent article on the subject in RAMTOP which was later reproduced in the Jan 87 edition of The PLOTTER. Anchor Automation offers no support for this modem, at present, but one free publication which explains the theory of the modem is available from Motorola. That is Application Note AN-891. write to Motorola, 3501 Ed Bluestein Blvd./Austin, TX 78721. This covers the chip set used in the 2050.